

## **Claims**

1. A method (40) for detecting network elements relaying communications between a base station and a mobile station in a cellular communication network, where time delays between base stations and mobile stations are monitored (42), characterised by that the communication relayed via at least one of the elements is detected (43) by the increase of time delay compared to the time delay of mobile stations communicating directly with the base station.

2. A method (40) according to claim 1, characterised by that the communication relaying elements are identified (44) on the ground of communication time delays.

3. A method (40) according to claim 1, characterised by that the timing advance value corresponding to the said time delay is calculated (42).

4. A method (40) according to claim 3, characterised by that the communications with timing advance values greater than some predetermined value are determined (43) to be relayed via at least one of the said elements.

5. A method (40) according to claim 4, characterised by that the said predetermined value is zero.

6. A method (40) according to claim 1, characterised by that the mobile communication network is a GSM network.

7. A method (40) according to claim 1, characterised by that when a presence of at least one of said elements is detected (45) for the first time, an event notice is sent (46) to a network management system.

8. A method (40) according to claim 1, characterised by that the time delay is monitored by a base transceiver station (BTS).

9. A method (40) according to claim 1, characterised by that the time delay is monitored by a base station controller (BSC).

10. A method (40) according to claim 1, characterised by that the communication relayed via at least one of said elements is monitored to determine various parameters giving information about the functioning of the network and said elements.

11. A method (40) according to claim 1, characterised by that at least one of said elements is a radio repeater.

12. A method (40) according to claim 1, **characterised by** that at least one of said elements is an optical tunnelling configuration.

13. A system (70) for detecting network elements (14) relaying communications between a base transceiver station (74) and a mobile station (21b) in cellular communication network, where time delays between base transceiver stations (74) and mobile stations (21a, 21b) are monitored, **characterised by** that the system (70) has means (71) for detecting communication relayed via at least one of the elements (14) by the increase of time delay compared to the time delays of mobile stations (21a) communicating directly with the base transceiver station (74).

10 14. A system (70) according to claim 13, **characterised by** that the system (70) has means (71) for identifying communication relaying elements on the grounds of the communication time delays.

15 15. A system (70) according to claim 13, **characterised by** that the mobile communication network is a GSM network.

16. A system (70) according to claim 13, **characterised by** that the system (70) has means (76) for sending an event notice to a network management system (75) when a presence of at least one of said elements (14) is detected for the first time.

17. A system (70) according to claim 13, **characterised by** that the system (70) has means (71) for carrying out measurements from the communication relayed via at least one of said elements (14).

18. A network element (72, 74) for cellular communication networks, **characterised by** that the element (72, 74) comprises a system (70) for identifying communication relaying elements on the grounds of the communication time delays.

19. A network element (72, 74) according to claim 18, **characterised by** that the network element is a base transceiver station (BTS) (74).

20. A network element (72, 74) according to claim 18, **characterised by** that the network element is a base station controller (BSC) (72).

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